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New Electrocatalysts for Hydrogen-Oxygen Fuel Cells

Pure platinum black has generally been regarded as the best catalyst material for oxygen reduction in hydrogen-oxygen alkaline fuel cells operating at temperatures below about 150°C. In the course of investigation on catalyst materials for this type of fuel cell, three new alloys were developed and found to be suitable for use as oxygen reduction catalysts in high-current-density cells.

One of these catalysts has a composition in atom % of 30Pt-70Ag. This alloy has a catalytic activity at least as high as that of pure platinum and is structurally superior to platinum. The catalyst was prepared from commercial platinum black and powdered silver oxide (Ag_2O). The composition of the second catalyst in atom % is 40Pd-60Au. This catalyst is very nearly as active as pure platinum. Although pure palladium (Pd) black used as a catalyst is reported to corrode during alkaline fuel cell operation, the new Pd-Au alloy showed no signs of corrosion or deterioration during 3000 hours of continuous operation. The composition of the third catalyst in atom % is 70Pt-30Au. This catalyst is more active than pure platinum. These catalysts were tested on polytetrafluoroethylene-bonded cathodes in fuel cells having a 35% KOH electrolyte concentration and a hydrogen anode with a 30 mil asbestos matrix. The operating temperature of the cells was 80°C.

Note:

The following documentation may be obtained from:

Clearinghouse for Federal Scientific
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Single document price \$3.00
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Reference: NASA CR-97624 (N69-10585),
Development of Cathodic Electrocatalysts for use in Low Temperature Hydrogen/Oxygen Fuel Cells with an Alkaline Electrolyte

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA Code GP, Washington, D.C. 20546.

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